

Thoughts on Graduate Student Research

02. Thesis & Dissertation Outlines

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What's the Difference?



- Size, length and depth of insight/reflection
- M.S. Thesis = 1 journal paper
- Ph.D. Dissertation = 3 journal papers

- Plus the other overlapping material

Traditional vs. Contemporary Layout



- Traditionally the thesis (& dissertation) was a treatise on specific topic, often published as a book
 - Usually considered “grey” literature
 - Now have a DOI <<https://doi.org/>> too
- The new format is to write papers with a “wrapper”
 - Easier to convert into publications
 - Publications are more easily searchable and discoverable
 - Have a DOI
 - Circulate on social media
 - Open Access?
 - \$?

Traditional Format



- Chapter 0: Title Page, Abstract, Acknowledgements, Table of Contents
1. Introduction
 2. Methodology
 3. Datasets and/or Study Site(s)
 4. Results
 5. Discussion
 6. Conclusions
 7. Recommendations
 8. References
 - Appendices A to ...

Contemporary Format



- Chapter 0: Title Page, Abstract, Acknowledgements, Table of Contents
1. Introduction
 2. Paper 1 (2 and 3 in same format)
 1. Introduction
 2. Methodology
 3. Datasets and/or Study Site(s)
 4. Results
 5. Discussion
 6. Conclusions
 3. Discussion
 4. Reflection (optional but recommended)
 - Appendices
- References can go at the end of each chapter or before the Appendices
 - The former is easier

Introduction Chapter



- Set up the problem
- Provide necessary background
 - Can be things that are known to the specific audience, but not known to the broader audience
 - e.g., the SNOTEL network and data that are collected
- End with the research questions/objectives
- Should still be succinct and focus on relevant material

Discussion Chapter



- What does it mean
- Why should we care
- Possible next steps
- Can cite tables and figures from the “paper” chapter
- Can include references

Reflection Chapter



- What are the bigger opportunities
- What did I learn
- References not necessary

Appendices



- Information that is important but too detailed to be in the main paper(s)
- Extra Tables and Figures
 - Detail is summarized in the main paper
- Data
 - New datasets should be published and thus discoverable
 - Now a requirement of many journals
 - A requirement from Federal funding
 - Good scientific etiquette

Paper Chapter(s)



- Written like a manuscript
- Should write an outline first
 - Purpose
 - Objectives (or research questions)
 - Main Methods
 - Main Results

Paper Introduction



- Be concise and specific
 - It is more difficult to write shorter than longer
- First paragraph – purpose
 - What is the bigger issue
 - How does your question/problem fit in with the bigger issue
- Second paragraph – scope
 - What have others done that is similar
 - What has not been done, that you are doing
- Third paragraph – objectives
 - Do not need to tell us what is in the rest of the paper

Objectives Sequence



- Objectives are presented in the Introduction
- They should be addressed in the same order in subsequent sections
 - Methods, Results, Discussion, Conclusions
 - Do not need to be explicitly re-stated
 - I copy them to each section to ensure I address them in order

Results versus Discussion



- Results
 - What are the key points in each Table or Figure
 - What should we be seeing, what don't we see? based on the objectives
 - What are the patterns (spatial) or trends (temporal), etc.
 - Do not repeat numbers in Tables or Figures (e.g., R^2 values)
 - Be specific
 - Don't start a paragraph with "Figure 3 is a plot of ..."
 - We know that when we read the caption
- Discussion
 - What do the results mean
 - How do they address your objectives
 - What caveats are there, were the assumptions met, etc.
 - Cite Tables and Figure, where relevant

Conclusions



- Address each objective
 - Was it met or not, and what was the key finding
- Do not cite tables, figures, or literature

Next Steps

